



ORDER NO. RD-764



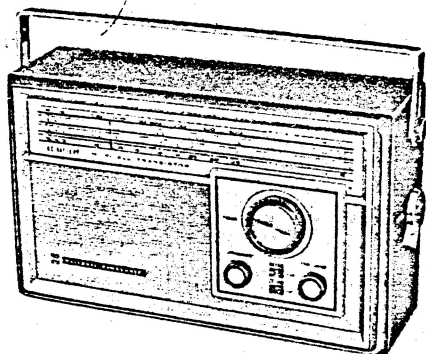
NATIONAL PANASONIC

Service Manual

4-BAND PORTABLE RADIO

MODEL **R-441B**

■ SPECIFICATIONS



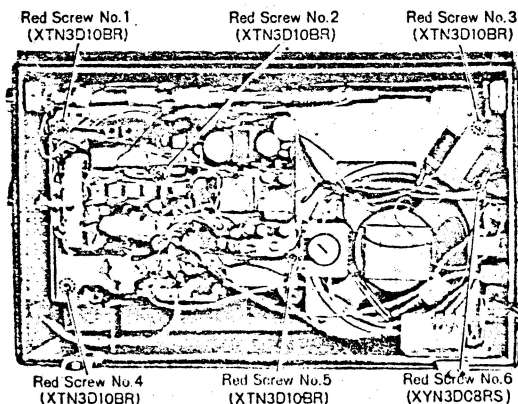
Frequency Range:	MW 525~1605 kHz (571~187m) SW ₁ 1.6~4.5 MHz (187~66.7m) SW ₂ 4.5~12 MHz (66.7~25.0m) SW ₃ 12~26.1 MHz (25.0~11.5m)
Intermediate Frequency:	455 kHz
Sensitivity:	MW 30 μ V/m for 50mW Output SW ₁ 30 μ V/m for 50mW Output SW ₂ 30 μ V/m for 50mW Output SW ₃ 30 μ V/m for 50mW Output
Power Output:	1W Maximum
Power Source:	AC 110V/220V 50-60Hz or 6V (Four "D" Size Flashlight Batteries) (NATIONAL UM-1 or equivalent)
Power Consumption:	4W (AC Only)
Speaker:	10cm (4") PM Dynamic Speaker
Dimensions:	296(Wide)×186(High)×99.5(Deep)mm (11 $\frac{1}{2}$ "×7 $\frac{1}{8}$ "×3 $\frac{3}{4}$ ")
Weight:	2kg. (4 lb. 6.5 oz.) without batteries
Impedance:	Speaker - 8 Ω Earphone Jack - 8 Ω Phono Jack - 470k Ω

■ TO REMOVE CHASSIS

1. Remove four (4) control knobs from cabinet.
2. Open the cabinet back cover by removing the two hooks on the lower part of the back cover.
3. Remove four (4) red chassis cover screws.
4. Pull out plugs.
5. Remove six (6) red chassis screws, nos. 1~6, as illustrated in figure.
6. To remove chassis completely, unsolder lead wires to speaker, battery, EXT. antenna & earth terminals and remove earphone, phono jack and AC cord from cabinet.
7. To reassemble, reverse the above procedure.

Note:

When mounting fine tuning knob, set red marking of the fine tuning shaft facing up and insert fine tuning knob onto the shaft, setting knobs dot to the center of red marking.

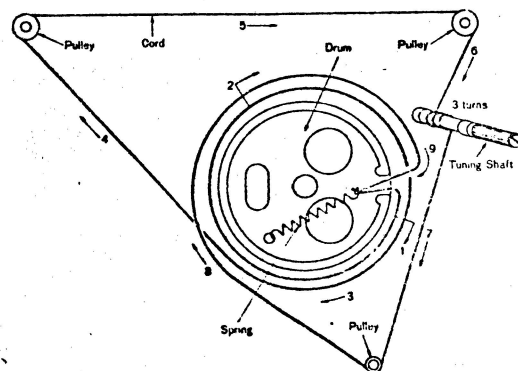


■ DIAL CORD INSTALLATION GUIDE

1. Remove dial back plate.
2. Dial cord length is 130cm (51 $\frac{3}{16}$ ").
3. Tuning gang is positioned at minimum capacity.
4. Arrows (1~9) indicate correct order and direction of installation dial cord.
5. Cement dial cord ends.

■ TO MOUNT DIAL POINTER

1. Set tuning gang fully closed position.
2. Set dial pointer to start point of dial back plate.
3. Attach dial cord to dial pointer.

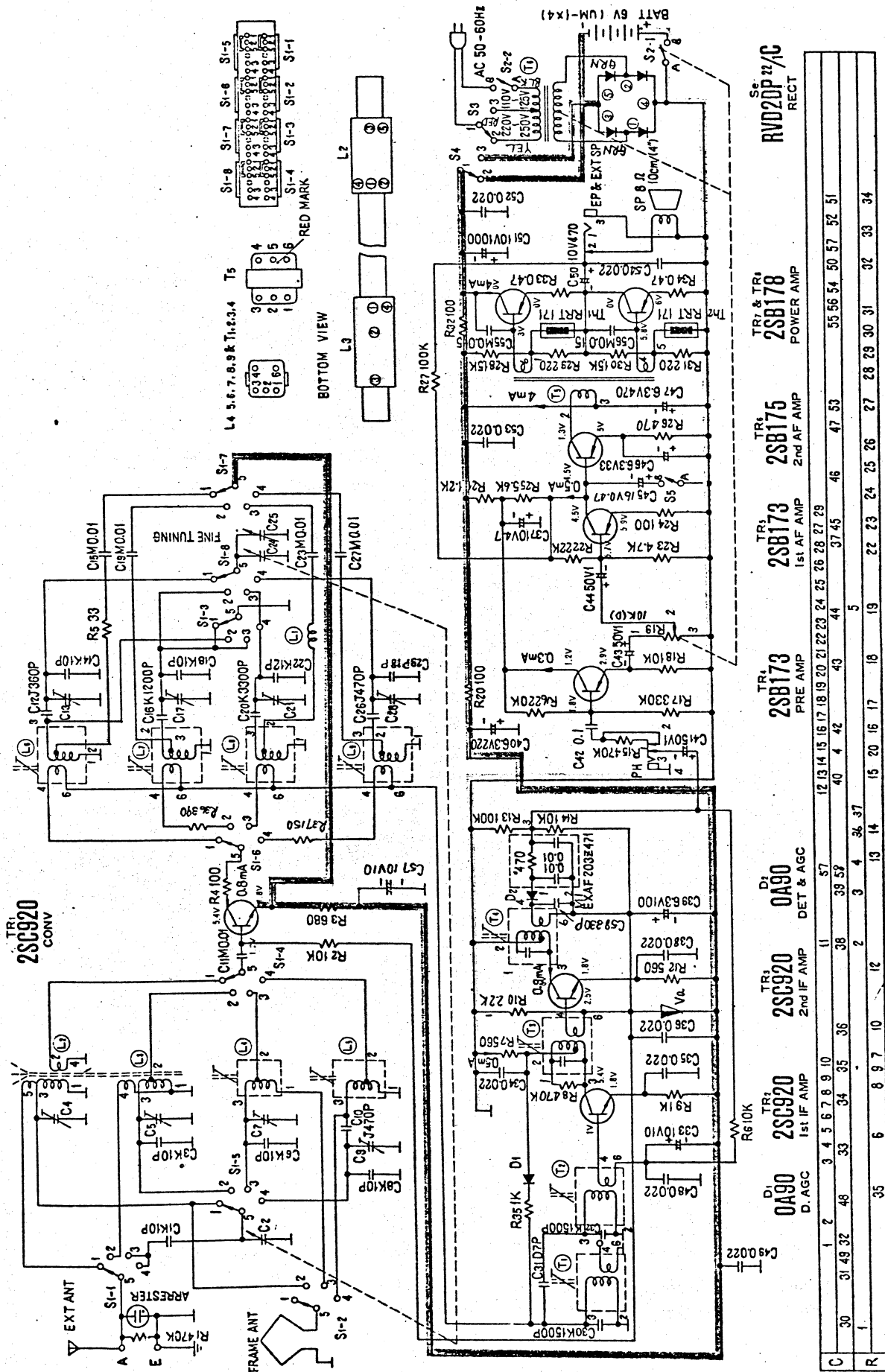


<EXPORT DIVISION>

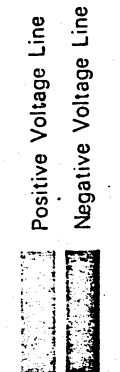
MATSUSHITA ELECTRIC TRADING CO., LTD.
P. O. Box 288 Central, Osaka, Japan

MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
RADIO and STEREO DIVISION

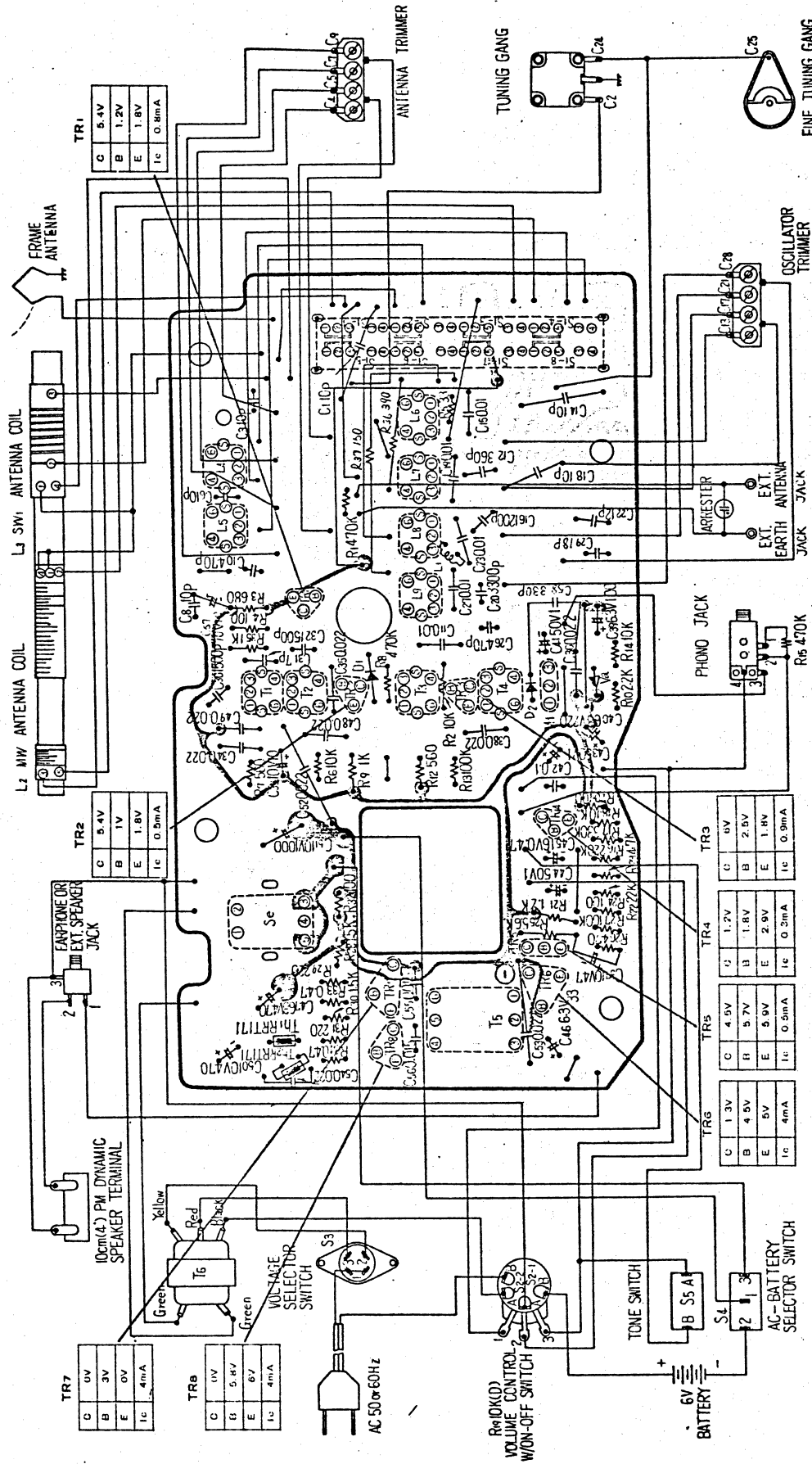
Schematic Diagram - Model R-441B



- Notes:
- S1-1~S1-7: Band selector switch in "MW" position.
 - S2-1, S2-2: Power source switch in "OFF" position.
 - S3: Voltage selector switch in "220~250V" position.
 - S4: AC-BATTERY selector switch in "BATTERY" position.
 - S5: Tone switch in "HIGH" position.
 - DC voltage measurements are taken with circuit tester 10kΩ/v from negative terminal of battery.
 - Battery current: No signal, 15mA
 - Maximum output: 150mA



Circuit Board Wiring View - Model R-441B



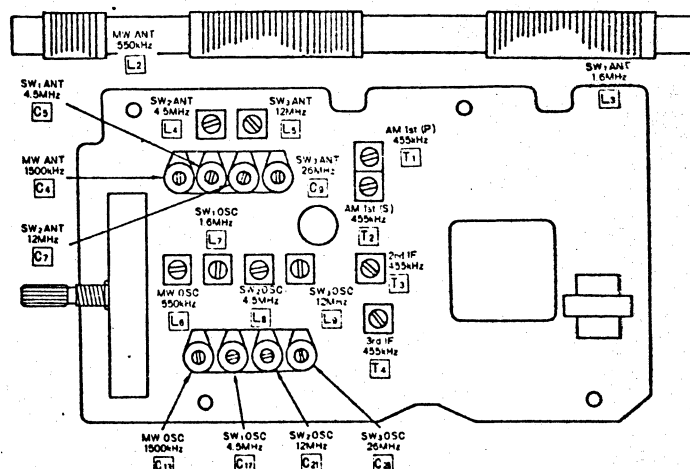
TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8	TR9	TR10	TR11	TR12	TR13	TR14	TR15	TR16	TR17	TR18	TR19	TR20	TR21	TR22	TR23	TR24	TR25	TR26	TR27	TR28	TR29	TR30	TR31	TR32	TR33	TR34	TR35	TR36	TR37	TR38	TR39	TR40	TR41	TR42	TR43	TR44	TR45	TR46	TR47	TR48	TR49	TR50	TR51	TR52	TR53	TR54	TR55	TR56	TR57	TR58	TR59	TR60	TR61	TR62	TR63	TR64	TR65	TR66	TR67	TR68	TR69	TR70	TR71	TR72	TR73	TR74	TR75	TR76	TR77	TR78	TR79	TR80	TR81	TR82	TR83	TR84	TR85	TR86	TR87	TR88	TR89	TR90	TR91	TR92	TR93	TR94	TR95	TR96	TR97	TR98	TR99	TR100
L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L15	L16	L17	L18	L19	L20	L21	L22	L23	L24	L25	L26	L27	L28	L29	L30	L31	L32	L33	L34	L35	L36	L37	L38	L39	L40	L41	L42	L43	L44	L45	L46	L47	L48	L49	L50	L51	L52	L53	L54	L55	L56	L57	L58	L59	L60	L61	L62	L63	L64	L65	L66	L67	L68	L69	L70	L71	L72	L73	L74	L75	L76	L77	L78	L79	L80	L81	L82	L83	L84	L85	L86	L87	L88	L89	L90	L91	L92	L93	L94	L95	L96	L97	L98	L99	L100

ALIGNMENT INSTRUCTIONS

Notes:

1. Set volume control to maximum.
2. Set tone switch to high.
3. Set band selector switch to MW, SW₁, SW₂ or SW₃.
4. Set AC-battery selector switch to battery.
5. Set fine tuning to center.
6. Set power source voltage to 6 volts DC.
7. Output of signal generator should be no higher than necessary to obtain an output reading.

SIGNAL GENERATOR		RADIO DIAL SETTING [DISTANCE]	INDICATOR (VTVM or SCOPE)	ADJUSTMENT	REMARKS
CONNECTIONS	FREQUENCY				
MW ALIGNMENT					
Fashion loop of several turns of wire and radiate signal into loop of receiver.	455 kHz 30% Mod. with 400 Hz.	Point of non- interference. (on/about 600 kHz)	Output meter across voice coil.	T ₁ (1st IFT)(P) T ₂ (1st IFT)(S) T ₃ (2nd IFT) T ₄ (3rd IFT)	Adjust for maximum output.
"	550 kHz	550 kHz [10.0mm ($\frac{1}{2}$ ")]	"	L ₆ (OSC Coil) (*) L ₂ (ANT Coil)	Adjust for maximum output. Adjust (L ₂) by moving coil bobbin along ferrite core.
"	1600 kHz	1600 kHz [96.3mm ($3\frac{7}{8}$ ")]	"	C ₁₃ (OSC Trimmer) C ₄ (ANT Trimmer)	Adjust for maximum output. Repeat steps (2) and (3).
SW1 ALIGNMENT					
"	1.6 MHz	1.6 MHz [3.3mm ($\frac{1}{8}$ ")]	"	L ₇ (OSC Coil) (*) L ₃ (ANT Coil)	Adjust for maximum output. Adjust L ₃ by moving coil bobbin along ferrite core.
"	4.5 MHz	4.5 MHz [103.0mm ($4\frac{1}{16}$ ")]	"	C ₁₇ (OSC Trimmer) C ₅ (ANT Trimmer)	Adjust for maximum output. Repeat steps (4) and (5).
* Cement antenna bobbin with wax after completing alignment.					
SW2 ALIGNMENT					
Stand frame antenna and radiate signal to frame antenna.	4.5 MHz	4.5 MHz [3.3mm ($\frac{1}{8}$ ")]	"	L ₈ (OSC Coil) L ₄ (ANT Coil)	Adjust for maximum output.
"	12 MHz	12 MHz [103.0mm ($4\frac{1}{16}$ ")]	"	C ₂₁ (OSC Trimmer) C ₇ (ANT Trimmer)	Adjust for maximum output. Repeat steps (6) and (7).
SW3 ALIGNMENT					
"	12 MHz	12 MHz [3.3mm ($\frac{1}{8}$ ")]	"	L ₉ (OSC Coil) L ₅ (ANT Coil)	Adjust for maximum output.
"	26 MHz	26 MHz [103.0mm ($4\frac{1}{16}$ ")]	"	C ₂₈ (OSC Trimmer) C ₉ (ANT Trimmer)	Adjust for maximum output. Repeat steps (8) and (9).



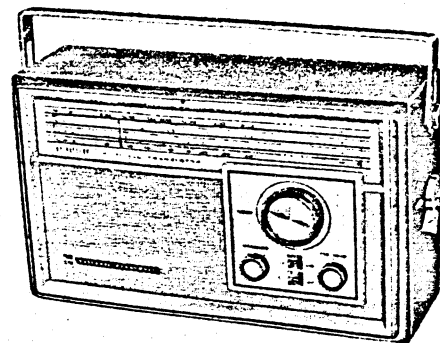
Alignment Points



REPLACEMENT PARTS LIST

RADIO MODEL R-441B

- NOTES:**
1. Part numbers are indicated on most mechanical parts. Please use this Part number for parts orders.
 2. Ⓝ indicates the New Parts.
 3. A—C rank: A rank parts will cover 80% of repair needs.
A+B rank parts will cover 95% of repair needs.
C rank parts are less necessary.
 4. Please use the "Price" column as desired.
 5. These parts are illustrated on pages according to their reference numbers.



R-441B

Ref.No.	Part No.	Description	Per Set (Pcs.)	Remarks	Price	
TRANSISTORS AND DIODES						
TR _{1,2,3}	2SC920	Converter & 1st, 2nd IF Amplifier	3	A		
TR _{4,5}	2SB173	Pre Amplifier & 1st AF Amplifier	2	A		
TR ₆	2SB175	2nd AF Amplifier	1	A		
TR _{7,8}	2SB178	Power Amplifier (push-pull)	2	A		
D _{1,2}	0A90	Detector & AGC, D.AGC	2	A		
THERMISTORS AND RECTIFIER						
Th _{1,2}	RRT171	Temperature Compensator	2	A		
Va	EYV320D1R2J2	Operation Compensator	1	A		
Se	RVD2DP22/1C	Rectifier	1	A		
COILS AND TRANSFORMERS						
L ₁	RLQY75S-5	Choke Coil	1	B		
L _{2,3}	RLF5G61	MW, SW ₁ Antenna Coil	1	A		
L ₄	RLA3B18-T	SW ₂ Antenna Coil	1	Ⓝ A		
L ₅	RLA3B21-T	SW ₃ Antenna Coil	1	Ⓝ A		
L ₆	RLO2B73-M	MW Oscillator Coil	1	Ⓝ A		
L ₇	RLO3B36-M	SW ₁ Oscillator Coil	1	Ⓝ A		
L ₈	RLO3B37-M	SW ₂ Oscillator Coil	1	Ⓝ A		
L ₉	RLO3B35-M	SW ₃ Oscillator Coil	1	Ⓝ A		
T _{1,2}	RLI2B152-M	1st IF Transformer	2	A		
T ₃	RLI2B250-M	2nd IF Transformer	1	A		
T ₄	RLI2B451-M	3rd IF Transformer	1	A		
T ₅	RLT3F35	Input Transformer, P=3KΩ : S=400Ω	1	A		
T ₆	RLT5J73	Power IF Transformer	1	Ⓝ A		

R-441B

Ref.No.	Part No.	Description	Per Set (Pcs.)	Remarks	Price	
RESISTORS						
R4, 20, 24, 32	ERD14VK101	100Ω, ¼Watt, ±10%, Carbon	4	B		
R7, 12	ERD14VK561	560Ω, ¼Watt, ±10%, Carbon	2	B		
R3	ERD14VK681	680Ω, ¼Watt, ±10%, Carbon	1	B		
R29, 31	ERD14VK221	220Ω, ¼Watt, ±10%, Carbon	2	B		
R5	ERD14VK330	33Ω, ¼Watt, ±10%, Carbon	1	B		
R9, 35	ERD14VK102	1KΩ, ¼Watt, ±10%, Carbon	2	B		
R28, 30	ERD14VK152	1.5KΩ, ¼Watt, ±10%, Carbon	2	B		
R10	ERD14VK222	2.2KΩ, ¼Watt, ±10%, Carbon	1	B		
R23,	ERD14VK472	4.7KΩ, ¼Watt, ±10%, Carbon	1	B		
R25	ERD14VK562	5.6KΩ, ¼Watt, ±10%, Carbon	1	B		
R21	ERD14VK122	1.2KΩ, ¼Watt, ±10%, Carbon	1	B		
R22	ERD14VK223	22KΩ, ¼Watt, ±10%, Carbon	1	B		
R2, 6, 18	ERD14VK103	10KΩ, ¼Watt, ±10%, Carbon	3	B		
R13, 27	ERD14VK104	100KΩ, ¼Watt, ±10%, Carbon	2	B		
R16,	ERD14VK224	220KΩ, ¼Watt, ±10%, Carbon	1	B		
R17	ERD14VK334	330KΩ, ¼Watt, ±10%, Carbon	1	B		
R1, 8	ERD14VK474	470KΩ, ¼Watt, ±10%, Carbon	2	B		
R14	ERD14TK103	10KΩ, ¼Watt, ±10%, Carbon	1	B		
R15	ERD14TK474	470KΩ, ¼Watt, ±10%, Carbon	1	B		
R33, 34	ERM12PKR47	0.47Ω, ½Watt, ±10%, Wire	2	B		
R26	ERD14VK471	470Ω, ¼Watt, ±10%, Carbon	1	B		
R37	ERD14TK151	150Ω, ¼Watt, ±10%, Carbon	1	B		
R36	ERD14TK391	390Ω, ¼Watt, ±10%, Carbon	1	B		
VARIABLE RESISTOR						
R19	EVCB0LL25D14	10KΩ (D), Volume Control	1	Ⓝ A		
CAPACITORS						
C31	ECCD05070DC	7mmf, 50WV, ±0.5mmf, Ceramic	1	C		
C1, 3, 6, 8, 14, 18	ECCD05100KC	10mmf, 50WV, ±10%, Ceramic	6	C		
C22	ECCD05120KC	12mmf, 50WV, ±10%, Ceramic	1	C		
C29	ECCD05180KC	18mmf, 50WV, ±10%, Ceramic	1	C		
C11, 15, 19, 23, 27	ECCKE05103MY	0.01mfd, 50WV, ±20%, Ceramic	5	C		
C34, 35, 36, 38, 48, 49, 52, 53, 54	ECCKE05223P	0.022mfd, 50WV, ±100%, Ceramic	9	C		
C10, 26	ECQS1471JZ	470mmf, 125WV, ±5%, Styrol	2	C		
C12	ECQS1361JZ	360mmf, 125WV, ±5%, Styrol	1	C		
C30, 32	ECQS1152KZ	1500mmf, 125WV, ±10%, Styrol	2	C		

Ref.No.	Part No.	Description	Per Set (Pcs.)	Remarks	Price	
C16	ECQS05122KZ	1200mmf, 50WV, $\pm 10\%$, Styrol	1	C		
C20	ECQS05332KZ	3300mmf, 50WV, $\pm 10\%$, Styrol	1	C		
C55, 56	ECQG05153MZ-N	0.015mfd, 50WV, $\pm 20\%$, Polyester	2	C		
C42	ECQG05104MZ-N	0.1mfd, 50WV, $\pm 20\%$, Polyester	1	C		
C45	ECAG16ER47	0.47mfd, 16WV, Electrolytic	1	B		
C46	ECEA6V33	33mfd, 6.3WV, Electrolytic	1	B		
C39	ECEA6V100	100mfd, 6.3WV, Electrolytic	1	B		
C40	ECEA6V220	220mfd, 6.3WV, Electrolytic	1	B		
C47	ECEA6V470	470mfd, 6.3WV, Electrolytic	1	B		
C33, 57	ECEA10V10	10mfd, 10WV, Electrolytic	2	B		
C51	ECEA10V1000	1000mfd, 10WV, Electrolytic	1	B		
C41, 43, 44	ECEA50V1	1mfd, 50WV, Electrolytic	3	B		
C37	ECEA10V47	47mfd, 10WV, Electrolytic	1	B		
C50	ECEA10V470	470mfd, 10WV, Electrolytic	1	B		
C58	ECCD05331K	330mmf, 50WV, $\pm 10\%$, Ceramic	1	C		
VARIABLE CAPACITORS						
C2, 24	PVC2K20N	Tuning Gang	1	A		
C4, 5, 7, 9, 13, 17, 21, 28	RCV4T-16M	Trimmer	2	A		
C25	ECV1YW02D49	Fine Tuning Gang	1	A		
COMPONENT COMBINATION						
M1	EXAF203Z471	0.01mfd, X2, 470 Ω	1	B		
SWITCHES						
S1-1~S1-7	RSR21A	Band Selector Switch	1	① A		
S3	RSR12A	Voltage Selector Switch	1	A		
S4	RSS107-1	AC-BATTERY Selector Switch	1	A		
S5	RSS71	Tone Switch	1	A		
SPEAKER						
SP	EAS10P70SA	10cm(4") PM Dynamic Speaker, 8 Ω	1	A		
CABINET						
	RYAR441BXA	Cabinet (Complete)	1	① A		
CA1	RKA79A	Cabinet Only	1	① C		
CA2	RSA27	Frame Antenna	1	A		

R-441B

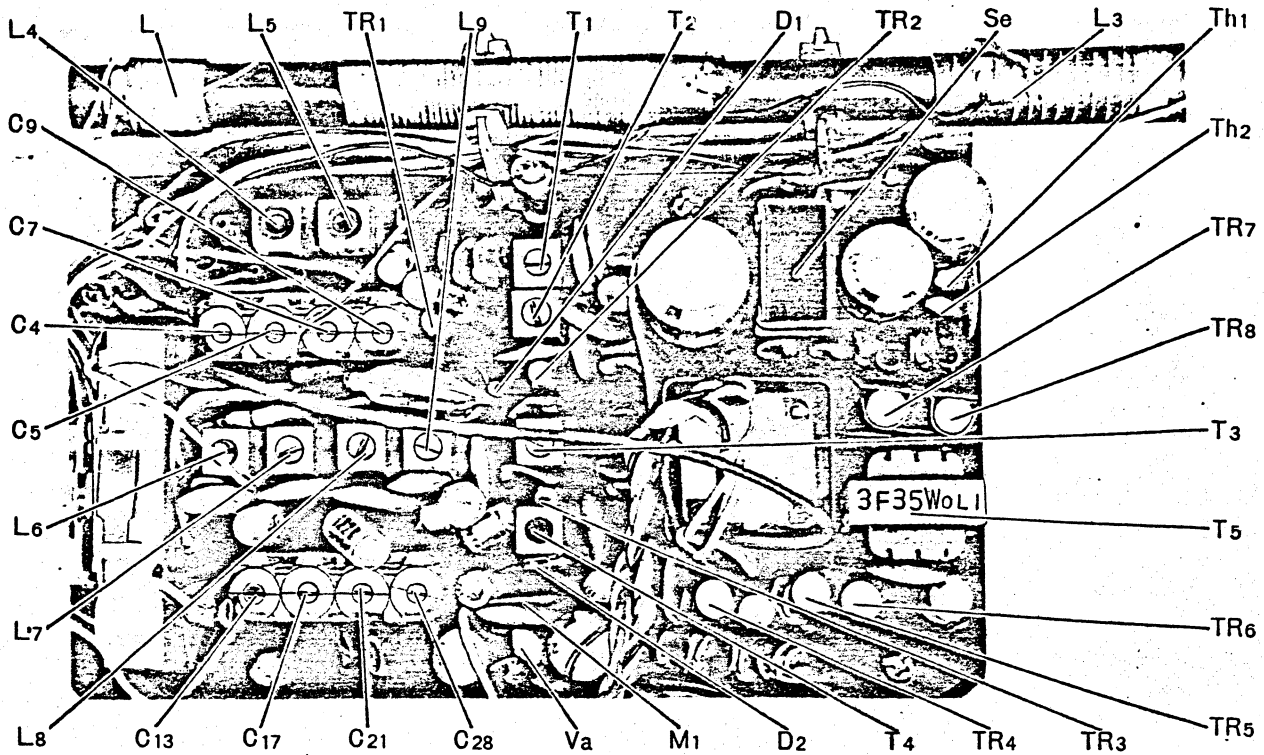
Ref.No.	Part No.	Description	Per Set (Pcs.)	Remarks	Price	
	RMA248	Bracket, Frame Antenna M'tg.	2	C		
	RMA249	Bracket, Frame Antenna M'tg.	2	C		
	RJS22-2	Jack, EXT. Antenna & Earth	2	B		
	RJS23	Terminal, EXT Antenna & Earth	2	B		
CA ₃	RDH234	Back Plate, Dial	1	B		
CA ₄	RKD3850	Scale, Dial	1	B		
CA ₅	RKH33	Handle, Cabinet	1	B		
CA ₆	RKT28	Metal Fitting, Handle M'tg.	2	C		
	RBY45S	Bracket, Handle M'tg.	2	C		
CA ₇	RGB295-1	Badge, NATIONAL PANASONIC Mark	1	C		
CA ₈	RGC860	Escutcheon	1	B		
CA ₉	RGK332	Indicating Plate	1	B		
CA ₁₀	RGM1630	Metal Grille	1	B		
CA ₁₁	RGX430	Ornament	1	B		
	RJB1015	Tube, Battery	1	B		
	RJB1018	Cover, Battery Tube	1	C		
	RMB6-3S	Bracket, Battery	1	C		
	XSN3D10S	Screw, Bracket M'tg.	1	C		
CA ₁₂	RBN46	Knob, Volume & Fine Tuning	2	A		
CA ₁₃	RBT130	Knob, Tuning	1	A		
CA ₁₄	RBS19A	Knob, Band Selector	1	Ⓝ A		
CHASSIS						
	RJA30	AC Cord, Power Source	1	B		
	RJJ70	Jack, Phono	1	B		
	RJJ78	Jack, Earphone	1	B		
	RJC102	Terminal, Battery, ⊕ Side	1	C		
	RJC502	Spring, Battery, ⊖ Side	1	B		
	RUV112A	Chassis Cover	1	Ⓝ B		
CH ₁	RMV2-1	Heat Sink, Transistor (TR ₇ & TR ₈)	1	C		
CH ₂	RDD4071-1	Drum, Dial, Large	1	Ⓝ B		
	RDD8008	Drum, Dial, Small	1	C		
CH ₃	RDH233-2	Back Plate, Dial	1	C		
CH ₄	RDT5243	Shaft, Tuning	1	A		
CH ₅	RDP215	Pointer, Dial	1	A		
CH ₆	RDS417	Spring, Dial	1	A		
CH ₇	RDZ05-3	Cord, Dial, 130cm (51 $\frac{3}{16}$ ")	1	B		
CH ₈	RHG111	Rubber Cushion, Core Antenna M'tg.	2	C		

Ref.No.	Part No.	Description	Per Set (Pcs.)	Remarks	Price	
	XYN3DC8RS	Red Screw, Chassis M'tg.	1	B		
	XTN3D10BR	Red Screw, Chassis M'tg.	5	B		
	XSN3D8RS	Red Screw, Chassis Cover M'tg.	2	B		
	XTN3D8RS	Red Screw, Chassis Cover M'tg.	2	B		
	XANR2T20	Neon Lamp, Arrester(100V)	1	A		
ACCESSORIES						
A ₁	EAE1FB	Magnetic Earphone, 8Ω	1	B		
A ₂	RJP74	Plug, Power Source	1	B		
A ₃	RJP75	Plug, Power Source	1	B		
A ₄	RJP39	Plug, EXT. Antenna	1	B		
PACKING						
P ₁	RPP155	Polyethylene Cover	1	C		
P ₂	RPG349A	Carton Box	1	Ⓝ C		
P ₃	RPN2003	Top Pad	2	C		
	RPN9050	Pad (Complete)	1	C		
P ₄	RPN2001	Pad L (Supply as RPN9050)	(1)	C		
P ₅	RPN2002	Pad R (Supply as RPN9050)	(1)	C		
P ₆	RQX5188A	Instruction Book	1	Ⓝ B		

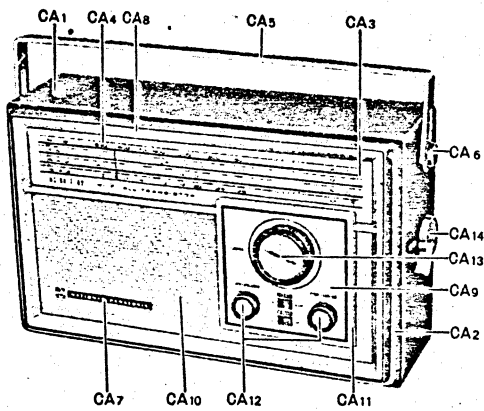
RECOMMENDED STOCK OF REPLACEMENT PARTS

Rank of Part	Estimated Selling Q'ty of Radio Set					
	100	500	1,000	2,000	5,000	10,000
A rank Parts	2	7	10	15	20	30
B rank Parts	1	3	5	7	10	20
C rank Parts	0	1	2	3	4	5

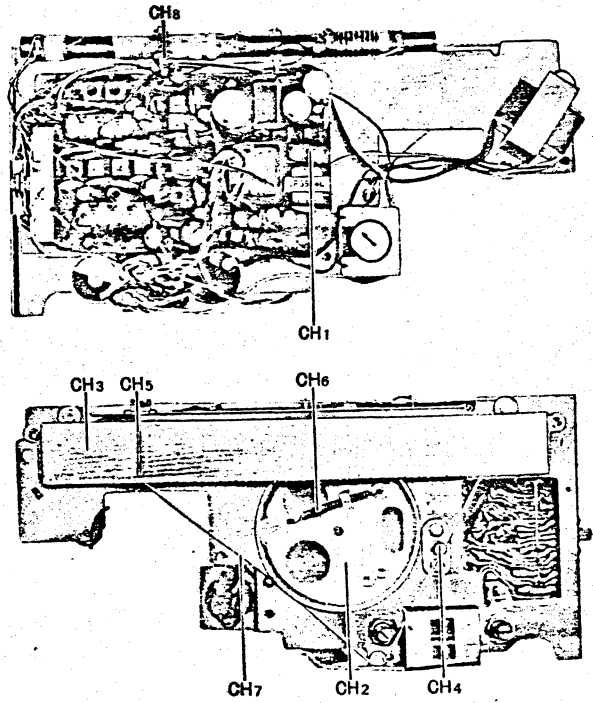
■ ELECTRIC PARTS LOCATIONS



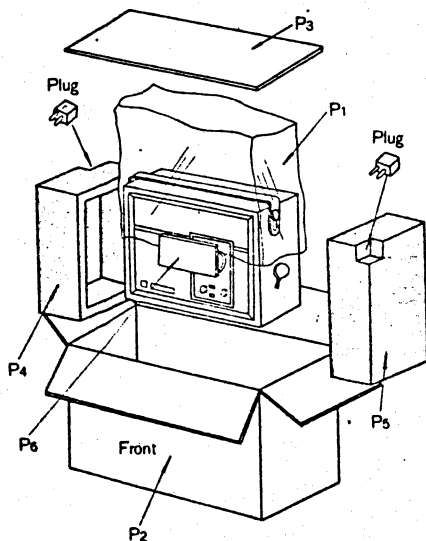
■ CABINET PARTS LOCATIONS



■ CHASSIS PARTS LOCATIONS



■ PACKING PARTS LOCATIONS



■ ACCESSORIES

